

WHAT IS CLAIMED IS:

1. A method of extracting metal from non-sterile soil, the method comprising the steps of adding an enhancing-bacteria to the soil and planting a metal-extracting plant in the soil, wherein the ability of the metal-extracting plant to extract metal present in the soil is enhanced by the presence of the enhancing-bacteria.
2. The method of claim 1 that further includes the step of growing the enhancing-bacteria.
3. The method of claim 1 wherein the metal is nickel.
4. The method of claim 1 wherein the plant is from the genus *Alyssum*.
5. The method of claim 4 wherein the plant is *Alyssum murale*.
6. The method of claim 1 wherein the enhancing-bacteria is one or more of the group consisting of *M. arabinogalactanolyticum* and *M. liquefaciens*.
7. The method of claim 6 wherein the enhancing-bacteria comprises rhizobacteria.
8. The method of claim 7 wherein the enhancing-bacteria comprises *M. arabinogalactanolyticum*.
9. The method of claim 7 wherein the enhancing-bacteria comprises *M. liquefaciens*.
10. The method of claim 1 wherein the plants are planted in the soil as seeds.
11. The method of claim 1 wherein the enhancing-bacteria is added to the seeds as well as to the soil.
12. The method of claim 11 wherein the enhancing-bacteria is one or more of the group consisting of *M. arabinogalactanolyticum* and *M. liquefaciens*.

13. The method of claim 11 wherein the enhancing-bacteria comprises rhizobacteria.
14. The method of claim 13 wherein the enhancing-bacteria comprises *M. arabinogalactanolyticum*.
15. The method of claim 13 wherein the enhancing-bacteria comprises *M. liquefaciens*.
16. The method of claim 11 wherein the seeds are surface sterilized before the enhancing-bacteria is added to the seeds.
17. The method of claim 11 wherein the seeds are those of *Alyssum murale*.
18. The method of claim 1 wherein the soil includes organic material in addition to the bacteria.
19. The method of claim 1 wherein the soil includes silt.
20. The method of claim 1 wherein the soil includes clay.
21. The method of claim 1 wherein the soil includes sand.
22. The method of claim 1 wherein the soil includes one or more metals from the group consisting of nickel, copper, zinc, potassium, manganese, phosphorus, magnesium and calcium.
23. The method of claim 1 wherein the soil includes at least one of the group consisting of sand, clay, and silt.
24. The method of claim 1 wherein the soil is autoclaved before the plants are planted.
25. The method of claim 1 wherein the plant is a hyperaccumulator.
26. A method of preparing soil that contains a metal for the extraction of the metal by a plant, the method comprising adding one or more enhancing-bacteria

strains to the soil wherein at least one of the enhancing-bacteria strains increases the ability of the plant to accumulate the metal.

27. The method of claim 26 that further includes the step of growing the enhancing-bacteria.

28. The method of claim 26 wherein the metal is nickel.

29. The method of claim 26 wherein the plant is from the genus *Alyssum*.

30. The method of claim 29 wherein the plant is *Alyssum murale*.

31. The method of claim 26 wherein the enhancing-bacteria comprises one or more of the group consisting of *M. arabinogalactanolyticum* and *M. liquefaciens*.

32. The method of claim 26 wherein the enhancing-bacteria comprises rhizobacteria.

33. The method of claim 32 wherein the enhancing-bacteria comprises *M. arabinogalactanolyticum*.

34. The method of claim 32 wherein the enhancing-bacteria comprises *M. liquefaciens*.

35. The method of claim 26 wherein the plants are planted in the soil as seeds.

36. The method of claim 35 wherein the enhancing-bacteria is added to the seeds as well as to the soil.

37. The method of claim 36 wherein the enhancing-bacteria comprises rhizobacteria.

38. The method of claim 37 wherein the enhancing-bacteria comprises *M. arabinogalactanolyticum*.

39. The method of claim 37 wherein the enhancing-bacteria comprises *M. liquefaciens*.

40. The method of claim 36 wherein the seeds are surface sterilized before the enhancing-bacteria is added to the seeds.

41. The method of claim 36 wherein the seeds are of *Alyssum murale*.

42. The method of claim 26 wherein the soil includes organic material in addition to the bacteria.

43. The method of claim 26 wherein the soil includes silt.

44. The method of claim 26 wherein the soil includes clay.

45. The method of claim 26 wherein the soil includes sand.

46. The method of claim 26 wherein the soil includes one or more from the group consisting of nickel, copper, zinc, potassium, manganese, phosphorus, magnesium and cadmium.

47. The method of claim 26 wherein the soil is nonsterile.

48. The method of claim 26 wherein the soil is autoclaved before the enhancing-bacteria is added to the soil.

49. A method of extracting nickel from soil, the method comprising the steps of adding an enhancing-bacteria to the soil and planting in the soil a metal-extracting plant that is a hyperaccumulator of nickel, wherein the ability of the metal-extracting plant to accumulate nickel is enhanced by the enhancing-bacteria in the soil.

50. The method of claim 49 that further includes the step of growing the enhancing-bacteria.

51. The method of claim 49 wherein the plant is from the genus *Alyssum*.

52. The method of claim 51 wherein the plant is *Alyssum murale*.

53. The method of claim 49 wherein the enhancing-bacteria is one or more of the group consisting of *M. arabinogalactanolyticum* and *M. liquefaciens*.

54. The method of claim 49 wherein the enhancing-bacteria is rhizobacteria.

55. The method of claim 54 wherein the enhancing-bacteria comprises *M. arabinogalactanolyticum*.

56. The method of claim 54 wherein the enhancing-bacteria comprises *M. liquefaciens*.

57. The method of claim 49 wherein the plants are planted in the soil as seeds.

58. The method of claim 57 wherein the enhancing-bacteria is added to the seeds as well as to the soil.

59. The method of claim 44 wherein the enhancing-bacteria is rhizobacteria.

60. The method of claim 59 wherein the enhancing-bacteria comprises *M. arabinogalactanolyticum*.

61. The method of claim 59 wherein the enhancing-bacteria comprises *M. liquefaciens*.

62. The method of claim 58 wherein the enhancing-bacteria is selected from one or more of the group consisting of *M. arabinogalactanolyticum* and *M. liquefaciens*.

63. The method of claim 58 wherein the seeds are surface sterilized before the enhancing-bacteria is added to the seeds.

64. The method of claim 58 wherein the seeds are those of *Alyssum murale*.

65. The method of claim 49 wherein the soil includes organic material in addition to the bacteria.

- 66. The method of claim 49 wherein the soil includes silt.
- 67. The method of claim 49 wherein the soil includes clay.
- 68. The method of claim 49 wherein the soil includes sand.
- 69. The method of claim 49 wherein the soil includes one or more metals from the group consisting of nickel, copper, zinc, potassium, manganese, phosphorus, magnesium and calcium.
- 70. The method of claim 49 wherein the soil is nonsterile.
- 71. The method of claim 49 wherein the soil is autoclaved before the metal-extracting plants are planted.
- 72. The method of claim 49 wherein the plant is a hyperaccumulator.